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EXAMINER	
QUIETT, CARRAMAH J	
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2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/773,882	MINAKUTI, JUN	
	Examiner	Art Unit	
	Carramah J. Quiett	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/06/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS), filed on 02/06/2004, has been placed in the application file, and the information referred to therein has been considered as to the merits.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

4. Claims 2-6, 8-17, and 17-20 are objected to because of the following informalities: For the objected claims, 2-6, 8-17, and 17-20, please change the preamble to "An image-sensing apparatus..." to "The image-sensing apparatus..." Please note that the objected claims depend from independent claims 1, 7, and 18. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 3, 4, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 3 recites the limitations "performing different calculation operations" and "...at least three brightness regions, namely *a region* in which all types of chrominance signals represent the first characteristic, *a region* in which all types of chrominance signals represent the second characteristic, and *a region* in which at least one of the different types of chrominance signals ..." in lines 1-6 of claim 3 on page 53 of the claims. In claim 1, "different calculation operations" are claimed. Are the Applicants referring to the different calculation operations of claim 1? Also in claim 1, "a first region" and "a second region" are claimed. Are the Applicants referring to the first and second regions of claim 1? Claim 3 is dependent on claim 1. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 4 recites the limitation "calculation operation". Are the Applicants referring to the different calculation operations of claim 1? There is insufficient antecedent basis for this limitation in the claim.

9. Claim 10 recites the limitation if "...at least three brightness regions, namely *a region* in which addition and subtraction are performed..., *a region* in which multiplication and division are performed..., and *a region* in which addition/subtraction and multiplication/division are performed ..." in lines 1-6 of claim 10 on page 56 of the claims. In claim 7, "a first region" and "a second region" are claimed. Is the applicant referring to the first and second regions of claim 7? There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. **Claims 1-16, 18, and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sano (U.S. Pat. 6,184,940) in view of Skow (U.S. Pat. 6,995,791).

For **claim 1**, Sano discloses an image-sensing apparatus (fig. 1) comprising:

a solid-state image sensor (ref. 101; col. 2, lines 14-55; col. 3, lines 17-51) including:

a plurality of pixels that perform photoelectric conversion (col. 3, lines 35-36; col. 5, lines 13-16) so as to generate output signals that vary with a first characteristic (long color signal) in a first region and with a second characteristic (short color signal) in a second region (high-brightness area) with respect to amount of incident light (col. 2, lines 14-55; col. 3, lines 17-51); and

a white balance circuit (refs. 130/140) that performs white balance processing by performing, on at least one of different types of chrominance signals outputted from the solid-state image sensor, different calculation operations fit respectively for the first and second

characteristics in the first and second regions so as to thereby generate new output data (col. 4, line 15 -- col. 5, line 55; fig. 2).

However, Sano does not expressly teach the image sensor including a plurality of types of color filters provided in vicinity of the pixels; and chrominance signals outputted as corresponding to the different types of color filters.

In a similar field of endeavor, Skow discloses an image-sensing apparatus comprising an image sensor (fig. 1, ref. 110) including a plurality of types of color filters provided in vicinity of the pixels; and chrominance signals outputted as corresponding to the different types of color filters (col. 5, lines 32-56; col. 6, lines 23-25; col. 8, lines 24-30). In light of the teaching of Skow, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image sensor of Sano with color filters in order to provide white balance for a Bayer Pattern digital image for use in various applications (Skow, col. 5, lines 32-56).

For **claim 2**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 1, wherein the first region is located on a lower-brightness side of the second region, and the output signals vary more greatly with the first characteristic than with the second characteristic with respect to the amount of incident light (Sano, col. 3, lines 17-30).

For **claim 3**, Sano, as modified by Skow, discloses An image-sensing apparatus as claimed in claim 1, wherein the white balance circuit performs the white balance processing by performing different calculation operations in at least three brightness regions, namely a region in which all types of chrominance signals represent the first characteristic, a region in which all types of chrominance signals represent the second characteristic, and a region in which at least one of the different types of chrominance signals represents the first characteristic and at least

one of the different types of chrominance signals represents the second characteristic (Sano, col. 2, lines 14-55; col. 3, lines 17-51; Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61).

For **claim 4**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 1, wherein the white balance circuit performs the white balance processing by, assuming that one of the different types of chrominance signals is a first chrominance signal that serves as a reference and another of the different types of chrominance signals is a second chrominance signal, performing a calculation operation on the second chrominance signal so as to make a photoelectric conversion characteristic thereof identical with a photoelectric conversion characteristic of the first chrominance signal (Sano, col. 5, lines 4-55; fig. 2; Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61; figs. 1 and 4).

For **claim 5**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 1, wherein a switching point at which the output values of all the types of chrominance signals switch between the first and second regions is identical (Skow, col. 11, lines 40-61 and col. 12, lines 19-28).

For **claim 6**, Sano, as modified by Skow, discloses An image-sensing apparatus as claimed in claim 1, wherein the white balance circuit has a look-up table in which are previously stored calculation results of the calculation operations so that the white balance processing is performed by generating the new output data of the different types of chrominance signals by using the look-up table (Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61).

For **claim 7**, Sano discloses an image-sensing apparatus (fig. 1) comprising:

a solid-state image sensor (ref. 101) including:

a plurality of pixels that perform photoelectric conversion (col. 3, lines 35-36; col. 5, lines 13-16) so as to generate output signals that vary with a first characteristic in a first region and with a second characteristic in a second region with respect to amount of incident light (col. 2, lines 14-55; col. 3, lines 17-51); and

a white balance circuit (refs. 130/140) to perform white balance processing on different types of chrominance signals outputted from the solid-state image sensor (col. 4, line 15 -- col. 5, line 55; fig. 2),

However, Sano does not expressly teach the image sensor including a plurality of types of color filters provided in vicinity of the pixels; and a white balance circuit having a first look-up table in which is stored information with which to perform white balance processing on different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor, wherein the first look-up table provides, as output data, signal levels that are corrected, relative to levels of input chrominance signals, for deviations among the different types of chrominance signals in such a way as to correspond to the first and second regions.

In a similar field of endeavor, Skow discloses an image-sensing apparatus comprising an image sensor (fig. 1, ref. 110) including a plurality of types of color filters provided in vicinity of the pixels (col. 5, lines 32-56; col. 6, lines 23-25; col. 8, lines 24-30); and

a white balance circuit (refs. 120-140) having a first look-up table in which is stored information with which to perform white balance processing on different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61),

wherein the first look-up table provides, as output data, signal levels that are corrected, relative to levels of input chrominance signals, for deviations among the different types of chrominance signals in such a way as to correspond to the first and second regions (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61). In light of the teaching of Skow, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image-sensing apparatus of Sano with the image-sensing apparatus, as recited in claim 7, in order to provide white balance for a Bayer Pattern digital image for use in various applications (Skow, col. 5, lines 32-56).

For **claim 8**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein the first region is located on a lower-brightness side of the second region, and the output signals vary more greatly with the first characteristic than with the second characteristic with respect to the amount of incident light (Sano, col. 3, lines 17-30).

For **claim 9**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein the first characteristic is such that the output signals vary linearly with respect to the amount of incident light, and the second characteristic is such that the output signals vary logarithmically with respect to the amount of incident light (Sano, col. 2, lines 14-55; col. 3, lines 17-51; Skow, col. 11, lines 40-61).

For **claim 10**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein the first look-up table provides output data that correspond to at least three brightness regions, namely a region in which addition and subtraction are performed among signal levels of the chrominance signals, a region in which multiplication and division are performed among signal levels of the chrominance signals, and a region in which

addition/subtraction and multiplication/division are performed on the chrominance signals. Please read Skow, col. 8, lines 24-51; col. 10, lines 54-63; col. 11, lines 9-67; and see figs. 1 and 4.

For **claim 11**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 7, further comprising: an evaluation value calculation circuit that, assuming that one of the different types of chrominance signals is a first chrominance signal that serves as a reference and another of the different types of chrominance signals is a second chrominance signal, calculates, for each type of second chrominance signal, an evaluation value that indicates a relationship between a photoelectric conversion characteristic of the first chrominance signal and a photoelectric conversion characteristic of the second chrominance signal on a basis of a relationship between signal levels of the first and second chrominance signals fed from the solid-state image sensor, wherein the first look-up table provides the output data on a basis of the evaluation value and the photoelectric conversion characteristic of the first chrominance signal. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 6, lines 23 -- col. 7, line 2; col. 8, lines 24-51; col. 10, lines 54-63; col. 11, lines 9-61; figs. 1 and 4.

For **claim 12**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 11,

wherein the evaluation value calculation circuit calculates the evaluation value on a basis of average values of the first and second chrominance signals, respectively. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 11, lines 9-61; figs. 1 and 4.

For **claim 13**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 12, wherein the evaluation value calculation circuit calculates the evaluation

value by calculating a first evaluation value on a basis of a relationship between average values of the first and second chrominance signals respectively as varying with the first characteristic, calculating a second evaluation value on a basis of a relationship between average values of the first and second chrominance signals respectively as varying with the second characteristic, and adding together the first and second evaluation value with weights. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 6, lines 23 -- col. 7, line 2; col. 8, lines 24-51; col. 10, lines 54-63; col. 11, lines 9-61; figs. 1 and 4.

For **claim 14**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 13, wherein the evaluation value calculation circuit sets the weights with which the first and second evaluation values are added together on a basis of a relationship between number of pixels that output signals that vary with the first characteristic with respect to the amount of incident light and number of pixels that output signals that vary with the second characteristic with respect to the amount of incident light.

For **claim 15**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein the information in the first look-up table is updated according to variation of a relationship among the signal levels of the different types of chrominance signals. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 11, lines 9-61; figs. 1 and 4.

For **claim 16**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 7, wherein a switching point at which the signal levels of the chrominance signals outputted from the solid-state image sensor switch between the first and second regions is variable (Skow, col. 11, lines 40-61 and col. 12, lines 19-28), and

the information in the first look-up table is updated according to variation of the switching point at which the signal levels of the chrominance signals switch between the first and second regions (Skow, col. 11, lines 40-61 and col. 12, lines 19-28).

For **claim 17**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 7, further comprising:

a second look-up table that, assuming that one of the different types of chrominance signals is a first chrominance signal that serves as a reference, has, as input addresses, signal levels of the first chrominance signal and provides, as output data, signal levels having processing other than the white balance processing performed thereon Skow, col. 11, lines 40-61 and col. 12, lines 19-28).

For **claim 18**, Sano discloses an image-sensing apparatus (fig. 1) comprising:

a solid-state image sensor (ref. 101) including:

a plurality of pixels that perform photoelectric conversion (col. 3, lines 35-36; col. 5, lines 13-16) so as to generate output signals that vary with a first characteristic in a first region and with a second characteristic in a second region with respect to amount of incident light (col. 2, lines 14-55; col. 3, lines 17-51); and

a white balance circuit (refs. 130/140) with which to adjust a white balance among different types of chrominance signals outputted from the solid-state image sensor (col. 4, line 15 -- col. 5, line 55; fig. 2),

wherein signal levels having white balance processing and processing other than the white balance processing performed thereon (col. 4, line 15 -- col. 5, line 55; fig. 2).

However, Sano does not expressly teach the image sensor including a plurality of types of color filters provided in vicinity of the pixels; and a white balance circuit having a look-up table in which is stored information with which to adjust a white balance among different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor, wherein the look-up table provides, as output data, signal levels having white balance processing and processing other than the white balance processing performed thereon.

In a similar field of endeavor, Skow discloses an image-sensing apparatus comprising an image sensor (fig. 1, ref. 110) including a plurality of types of color filters provided in vicinity of the pixels (col. 5, lines 32-56; col. 6, lines 23-25; col. 8, lines 24-30); and

a white balance circuit (refs. 120-140) having a look-up table in which is stored information with which to adjust a white balance among different types of chrominance signals outputted as corresponding to the different types of color filters from the solid-state image sensor (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61),

wherein the look-up table provides, as output data, signal levels having white balance processing and processing other than the white balance processing performed thereon (col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61). In light of the teaching of Skow, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image-sensing apparatus of Sano with the image-sensing apparatus, as recited in claim 7, in order to provide white balance for a Bayer Pattern digital image for use in various applications (Skow, col. 5, lines 32-56).

For **claim 20**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 18, wherein the look-up table provides, as output data, signal levels having white balance processing and gain adjustment processing for exposure control performed thereon. Please read Sano, col. 5, lines 4-55; fig. 2; and Skow, col. 11, lines 9-61; figs. 1 and 4.

13. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sano (U.S. Pat. 6,184,940) in view of Skow (U.S. Pat. 6,995,791) as applied to claim 18 above, and further in view of Sano et al. (U.S. Pat. 6,972,800).

For **claim 19**, Sano, as modified by Skow, discloses an image-sensing apparatus as claimed in claim 18, wherein the look-up table provides, as output data, signal levels having white balance processing (Sano col. 4, line 15 -- col. 5, line 55; Skow, col. 6, lines 23 -- col. 7, line 2; col. 11, lines 40-61);

In a similar field of endeavor, Sano et al. discloses gradation conversion processing performed thereon (fig. 1, ref. 8; col. 7, line 63 – col. 8, line 1). In light of the teaching of Sano et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image-sensing apparatus of Sano with the image-sensing apparatus, as recited in claim 7, in order to provide contrast thereby improving the dynamic range performance (Sano et al., col. 1, lines 24-27; col. 7, line 63 – col. 8, line 1).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamamoto et al. (US 5,481,302) A white balance adjustment apparatus for adjusting red,

	green, blue video signals.
Yamamoto et al. (US 6,078,357)	An image mixing circuit usable in a video camera for mixing with a continuous gradation characteristic.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carramah J. Quiett whose telephone number is (571) 272-7316. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CJQ
December 7, 2007

NGOC-YEN VU
SUPERVISORY PATENT EXAMINER